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12/31/2003

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79945

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EXAMINER

SWEENEY, PATRICK E

ART UNIT

PAPER NUMBER

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DELIVERY MODE

10/17/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/750,351	Applicant(s) DAVIES ET AL.	
	Examiner PATRICK E. SWEENEY	Art Unit 2162	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This Action is in response to the Amended filing of June 12, 2008. Claims 1-17 are pending and have been considered below.
2. As to Applicant's Arguments/Remarks filed on June 12, 2008, please see the Examiner's response in "**Response to Arguments**" following this Office Action. The Applicant's arguments have been fully considered but they are moot in view of new grounds of rejection. **Accordingly, this Action is made Final. (It is noted the name of this action is Non-Final Rejection.doc due to typographical error and it should read Final Rejection.doc. /Kuen Lu/, Primary Examiner, Art Unit 2169).**

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.
4. Claims 1, and 3-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Oki et al. (US 5,802,528) in view of Caulfield et al. (US 2004/0158562).

Claim 1: Oki discloses a method for determining the similarity of data records in first and second data sets, the data records having an informational content, the method comprising:

- **Receiving a first data set from a first data source, the first data set including a first number of data records** (See Oki column 1, lines 30-44 where it is disclosed that a set of data is received from a base site and compared against data received from a replicated site);
- **Receiving a second data set from a second data source, the second data set having a second number of data records** (See Oki column 1, lines 30-44 where it is disclosed that a set of data is received from a base site and compared against data received from a replicated site);
- identifying a first data record in the first data set that is potentially identical to a second data record in the second data set, the identified first and second data records having an informational content that is non-identical but similar (See Oki column 1, lines 31-54 where it is disclosed that records from two sets of data are compared to identify if they are potentially identical or different);

But Oki does not explicitly disclose **determining a similarity level between the individual data records that make up the data sets**. However Caulfield discloses a method for comparing and synchronizing data sets where similarity scores are calculated for each record pair (See Caulfield page 1, paragraphs [0010] – [0018]).

Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the teachings of Oki and Caulfield and to determine a similarity level between the first data record and the second data record. One would have been motivated to combine the teachings of Oki and Caulfield since they are both

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directed toward synchronizing data sets, and Caulfield proposes additionally methods to facilitate identifying which portions of the data sets are different.

The combined teachings of Oki and Caulfield further disclose

- **determining whether the first and second data records identified as potentially identical are truly identical based upon a predetermined criteria** (See Caulfield page 5, paragraph [0094] where the records identified as potentially identical are determined to be truly identical if the calculated similarity score shows that they match completely).

Claim 3: Oki and Caulfield disclose the method of claim 1 wherein identifying a first data record and a second data record includes grouping the records in the first and second data sets into groups based upon a predetermined criteria (See Oki column 5, lines 17-65 where it is disclosed that the data can be grouped into separate hash buckets to facilitate the comparison).

Claim 4: Oki and Caulfield disclose the method of claim 1 wherein identifying includes comparing the informational content of first data record to the informational content of the second data record (See Oki column 4, lines 51-66 where it is disclosed that the informational content of the records are compared).

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Claim 5: Oki discloses a method for determining different data records in a telecommunications system from records in first and second data sets in a comprising:

- Receiving a first data set from a first data source, the first data set including a first number of data records (See Oki column 1, lines 30-44 where it is disclosed that a set of data is received from a base site and compared against data received from a replicated site);
- Receiving a second data set from a second data source, the second data set having a second number of data records (See Oki column 1, lines 30-44 where it is disclosed that a set of data is received from a base site and compared against data received from a replicated site);
- determining potentially different data records in the first data set at least in part by comparing records in the first data set to records in the second data set wherein the determining is achieved without reducing the first number of records or the second number of records; (See Oki column 1, lines 31-54 where it is disclosed that records from two sets of data are compared to identify if they are identical or different. The cited portion of Oki discloses that the two sets of data to be compared are subsets of larger portions of data, however the Oki does not disclose reducing the number of records of the subsets in the comparison process);

But Oki does not explicitly disclose that the compared records have a level of similarity other than determining whether they are likely identical certainly different. However Caulfield discloses a method for comparing and synchronizing data sets where similarity

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scores are calculated for each record pair (See Caulfield page 1, paragraphs [0010] – [0018]). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a similarity level between the first data record and the second data record. One would have been motivated to combine the teachings of Oki and Caulfield since they are both directed toward synchronizing data sets, and Caulfield proposes additionally methods to facilitate identifying which portions of the data sets are different.

The combined teachings of Oki and Caulfield further disclose

- verifying that the potentially different records identified as potentially different are truly different at least in part by using the level of similarity between the potentially different data records (See Caulfield page 5, paragraph [0094] where the records identified as potentially identical are determined to be truly identical if the calculated similarity score shows that they match completely).

Claim 6: Oki and Caulfield disclose the method of claim 5 wherein the different data records can be faulty data records or mismatched data records (See Oki column 1, lines 10-28 where it is disclosed that the records may be different for any number of reasons, including data replication errors which would render the records faulty).

Claim 7: Oki and Caulfield disclose the method of claim 5 wherein determining potentially different data records includes defining a set of similarity characteristics,

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grouping the data records in each of the first and second sets according to the similarity characteristics into similarity groups, and comparing the similarity groups in the first data set to the similarity groups in the second data set (See Oki column 5, lines 17-65 where it is disclosed that records are grouped according to a hashing function, and that individual groups are compared with their counterparts in the other set of data).

Claim 8: Oki and Caulfield disclose the method of claim 5 wherein determining potentially different data records includes determining whether each record in the first data set completely matches with a data record in the second data set (See Oki column 1, lines 31-54 where it is disclosed that the records are compared to determine if they are identical or not).

Claim 9: Oki and Caulfield disclose the method of claim 5 wherein verifying includes determining from the second data set a set of data records that are similar to the potentially different record identified in the first data set (See Oki column 5, lines 17-65 where it is disclosed that the first and second data sets are grouped using identical hash functions, and that the groups in the first data set will therefore correspond to the groups in the second data set).

Claim 10: Oki and Caulfield disclose the method of claim 5 wherein verifying includes

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- scoring elements of each of the plurality of data records to form a plurality of scores (See Oki column 5, lines 17-61 where it is disclosed that checksums are calculated for each data record based on the information in the data record),
- comparing the test score to a predetermined minimum score (See Oki column 5, lines 17-61 where it is disclosed that the resulting checksums of the first set of data are compared to the checksums from the second set of data), and
- determining a different record if the comparison determines the test score is unacceptable (See Oki column 5 lines 17-61 where it is disclosed that the comparison based on the checksums determines the differences between the data sets. Also see Oki column 1, lines 30-54 where it is disclosed that these differences can be used to determine a different, third record that can be used to modify the original data sets).

But Oki does not explicitly disclose multiplying the plurality of scores to form a test score. However Oki does disclose that the scores calculated are checksums, and can be combined to form larger checksums (See Oki column 5, lines 46-61). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to multiply the plurality of scores to form the test score. One would have been motivated to multiply the scores to form the test score because Oki was using a checksum method, and a checksum uses a mathematical function not limited to multiplication to compute the checksum and combine checksums.

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Claim 11: Oki and Caulfield disclose the method of claim 5 further comprising taking an action relating to the different data records (See Oki column 5, lines 17-65 where it is disclosed that the records that are different are identified and output).

Claim 12: Oki discloses a device for determining faulty data records in a telecommunications system from records in first and second data sets in a comprising:

- a data store arranged and configured to store first and second data sets (See Oki column 4, lines 9-19 where is disclosed that the data to be compared is moved to a single computing device. Also see Oki column 2, lines 40-66 where it is disclosed that the computing device has storage memory for storing the data sets); and
- a processor coupled to the data store and having an output (See Oki column 3, lines 23-39 where it is disclosed that the methods can be performed by a computer system having a processor to execute the steps of the method),
- the processor arranged and configured to receive a first data set from a first data source, the first data set including a first number of data records and to receive a second data set from a second data source, the second data set having a second number of data records, the processor storing the first and second data sets in the data store (See Oki column 1, lines 30-44 where it is disclosed that a set of data is received from a base site and compared against data received from a replicated site) such that the processor

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- identifies potentially different data records in the first data set at least in part by comparing records in the first data set to records in the second data set (See Oki column 1, lines 31-54 where it is disclosed that records from two sets of data are compared to identify if they are identical or different)

But Oki does not explicitly disclose that the compared records have a level of similarity between them. However Caulfield discloses a method for comparing and synchronizing data sets where similarity scores are calculated for each record pair (See Caulfield page 1, paragraphs [0010] – [0018]). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to determine a similarity level between the first data record and the second data record. One would have been motivated to combine the teachings of Oki and Caulfield since they are both directed toward synchronizing data sets, and Caulfield proposes additionally methods to facilitate identifying which portions of the data sets are different.

The combined teachings of Oki and Caulfield further disclose that the processor:

- verifies that the potentially different records already identified as potentially different are different at least in part by using the similarity level and without reducing the first number of records or the second number of records (See Caulfield page 5, paragraph [0094] where the records identified as potentially identical are determined to be truly identical if the calculated similarity score shows that they match completely. Also see

Oki column 1, lines 31-54 where it is disclosed that based on the comparison between the two sets of data it is determined if individual records are identical or not. The cited portion of Oki discloses that the two sets of data to be compared are subsets of larger portions of data, however the Oki does not disclose reducing the number of records of the subsets in the comparison process) and

- such that the processor identifies the different records on the output (See Oki column 1, lines 31-54 where it is disclosed that a result identifying the differences between the two data sets is output).

Claim 13: Oki and Caulfield disclose the device of claim 12 wherein the processor includes means for defining a set of similarity characteristics, means for grouping the data records in each of the first and second sets according to the similarity characteristics into similarity groups, and means for comparing the similarity groups in the first data set to the similarity groups in the second data set.

Claim 14: Oki and Caulfield disclose the device of claim 12 wherein the processor includes means for determining whether each record in the first data set completely matches with a data record in the second data set (See Oki column 5, lines 17-65 where it is disclosed that records are grouped according to a hashing function, and that individual groups are compared with their counterparts in the other set of data).

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Claim 15: Oki and Caulfield disclose the device of claim 12 wherein the processor includes means for determining from the second data set a set of data records that are similar to the potentially faulty record identified in the first data set (See Oki column 5, lines 17-65 where it is disclosed that records are grouped according to a hashing function, and that individual groups are compared with their counterparts in the other set of data).

Claim 16: Oki discloses the device of claim 12 wherein the processor includes

- means for scoring elements of each of the plurality of data records to form a plurality of scores (See Oki column 5, lines 17-61 where it is disclosed that checksums are calculated for each data record based on the information in the data record),
- means for comparing the test score to a predetermined minimum score (See Oki column 5, lines 17-61 where it is disclosed that the resulting checksums of the first set of data are compared to the checksums from the second set of data), and
- means for determining a different record if the comparison determines the test score is unacceptable (See Oki column 5 lines 17-61 where it is disclosed that the comparison based on the checksums determines the differences between the data sets. Also see Oki column 1, lines 30-54 where it is disclosed that these differences can be used to determine a different, third record that can be used to modify the original data sets).

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But Oki does not explicitly disclose multiplying the plurality of scores to form a test score. However Oki does disclose that the scores calculated are checksums, and can be combined to form larger checksums (See Oki column 5, lines 46-61). Therefore it would have been obvious to one having ordinary skill in the art at the time the invention was made to multiply the plurality of scores to form the test score. One would have been motivated to multiply the scores to form the test score because Oki was using a checksum method, and a checksum uses a mathematical function not limited to multiplication to compute the checksum and combine checksums.

Claim 17: Oki and Caulfield disclose the device of claim 12 wherein the different data records can be faulty data records or mismatched data records (See Oki column 1, lines 10-28 where it is disclosed that the records may be different for any number of reasons, including data replication errors which would render the records faulty).

5. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Oki et al. (US 5,802,528) and Caulfield et al. (US 2004/0158562) as applied to claim 1 above, and further in view of Becker et al. (US 6,598,119).

Claim 2: Oki and Caulfield disclose the method of claim 1 but do not explicitly disclose that identifying a first and second data records identifies telecommunication call detail records (CDRs). However Becker discloses that replication and synchronization techniques can be used on data sets including call detail records (See Becker Abstract).

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Therefore it would have been obvious to one having ordinary skill in the art to combine the teachings of Oki and Becker and that the first and second data records could identify telecommunication call detail records. One would have been motivated to combine the teachings of Oki, Caulfield and Becker because they are directed to data management, and Becker teaches using replication and synchronization techniques on additional data types.

Response to Arguments

6. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

7. Applicant's arguments filed June 12, 2008 have been fully considered but they are not persuasive.

On pages 6-7 of the Applicant's remarks the Applicant argues that the independent claims have been amended to recite that the data that is being compared originates from a first source and a second source. The Applicant argues that Oki fails to teach or suggest this because Oki describes a system for comparing sets of replicated data originating from the same source, which is then copied to different locations.

The Examiner respectfully submits that Oki's system of comparing data that had been copied data to remote locations with the original data would, given the broadest

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reasonable interpretation, be understood as comparing data from two different sources. Given the current claim language it does not appear that it is relevant that the data sets being compared are a replicated data set and the original data set, since Oki discloses obtaining those data sets from two different sources (See Oki column 1, lines 30-43). In the cited portion of Oki it is disclosed that the copied data is retrieved from the original source and the replicated source for comparison to determine similarity. Furthermore a "first data source" and a "second data source", given the broadest reasonable interpretation, may be referring to the same data source. It is not clear from the claim language that the data sources are in fact separate entities.

In light of the above the Examiner respectfully submits that Oki sufficiently discloses the first and second data sources as claimed.

On pages 6-7 of the Applicant's remarks the Applicant argues that Oki fails to teach or suggest retaining the same number of data records when processing data sets as recited in claim 1. The Applicant argues that Oki uses statistical sampling approaches that determine whether an entire data set is identical to another one.

The Examiner respectfully submits that Oki's use of statistical sampling is conducted before the comparison steps, indeed it selects the data sets to be compared, and that Oki still discloses directly comparing the two data sets without reducing the number of records (See Oki column 1, lines 30-43). Although the Examiner acknowledges that Oki uses the comparison to determine facts about the larger data sets, the Examiner respectfully maintains that the actual comparison steps performed

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by Oki on the selected data sets are sufficient to disclose retaining the same number of data records when processing the data sets.

In light of the above arguments and the new grounds of rejection, the Examiner respectfully maintains the rejections to claims 1-17.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- a. Brill et al. (US 2007/0016616) discloses an automated error checking system and method.
- b. Sasaki et al. (US 2007/0143358) discloses a data synchronization system and method.
- c. Zoltan (US 2003/0158868) discloses a system for synchronizing replicated data.
- d. Mau (US 7,222,139) discloses a method for synchronizing data.
- e. Swaminathan et al. (US 2004/0267729) discloses a system for managing data across an enterprise.
- f. Givoly et al. (US 2002/0199024) discloses a threshold-based database system

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICK E. SWEENEY whose telephone number is (571)270-1687. The examiner can normally be reached on Mon. - Fri. (Alternate Fridays Off) EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on (571)272-4107. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Patrick E Sweeney/
Examiner, Art Unit 2162

/Kuen S Lu/
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